

Space Weather Forecast

Issued on Sunday, 28 May 2023 at 13:32 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: R1/R2 radio blackouts likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low to Moderate, with one Moderate flare observed from the large sunspot region in the south at 28/1036 UTC. There were also a couple moderate Common-class flares observed from the northwest. There are currently 8 regions on the visible disc with a region in the southeast coming and going in the period. The region in the southwest is the largest on the disc and it is magnetically complex. There are two regions in the northwest which are also magnetically complex, but are significantly smaller. All other regions on the disc are either small or simple.

Two Coronal Mass Ejections (CMEs) were observed during the period, one from the east horizon from 27/1215 UTC and one to the south from 27/2000 UTC. Both of these are thought not to be Earth directed.

Solar Wind / Geomagnetic Activity: Solar winds have been slightly elevated between 400 and 500 km/s. The total interplanetary magnetic field strength has been weak. The north-south component has been predominantly negative since 27/1500 UTC, all be it weak. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low to Moderate, with the main risk of flare activity from the large region in the south. There is a slight chance of Strong class flares.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 25th May could glance the Earth on 29th May. A further feature which left the Sun on 26th May could glance Earth late on 30th or 31st May. Solar winds are likely to remain slightly elevated through much of the forecast period due to slight enhancements from coronal hole features. Geomagnetic activity is expected to be mainly Quiet to Unsettled, but with a risk of Active or Minor Geomagnetic Storms on both 29th-31st May due to potential CME impacts.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels with solar radiation storms unlikely to occur. However, there is a slight chance of reaching the Minor Storm threshold should any larger flares occur, mainly from the large region in the south.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	20	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)